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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GOLDBERG, JEANINE ANNE	

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/804,291	ZOZULYA, SERGEY	
	Examiner	Art Unit	
	Jeanine A Goldberg	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-124* is/are pending in the application.

4a) Of the above claim(s) *60-76,81 and 85-124* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-59,77-80 and 82-84* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is in response to the papers filed July 2, 2003. Currently, claims 1-124 are pending. Claims 60-76, 81, 85-124 have been withdrawn as drawn to non-elected subject matter. Claims 1-59, 77-80, 82-84 have been examined on the merits.

Election/Restrictions

2. Applicant's election with traverse of Group I in the paper filed July 2, 2003 is acknowledged.

The response traverses the rejection on the basis that Group I and II should be examined together. This argument has been thoroughly reviewed, but is not found persuasive because the nucleic acid and the polypeptides of Group I and II are independent and distinct inventions. The search of the nucleic acid and the polypeptides are not coextensive. Moreover, for the reasons set forth in the restriction requirement, the separate status and distinct structures of the products are distinct.

The response traverses the rejection on the basis that other olfactory sequence members should be included. This argument has been thoroughly reviewed, but is not found persuasive because the OR sequences are patentably distinct. As invited in the restriction, there are no arguments or reasons of record why the search for one sequence is coextensive of each other olfactory nucleic acid.

Claims 60-76, 81, 85-124 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable

generic or linking claim. Applicant timely traversed the restriction (election) requirement.

The requirement is still deemed proper and is therefore made FINAL.

This application contains claims 60-76, 81, 85-124 drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Priority

3. This application claims priority to numerous provisional applications.

Drawings

4. The drawings are objected to because sequences are presented in the drawings which are not identified by sequence identifier in either the description of the drawings or the figure. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-59, 77-80, 82-84 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific asserted utility or a well established utility.

The specification states that the invention relates to newly identified mammalian chemosensory G protein-coupled receptors, particularly olfactory receptors (page 1).

The specification states that the invention has application in the selection and design of odorant compositions, as well as malodor blockers, particularly perfumes and fragrance compositions and components of deodorants (page 1). The specification states that the invention provides a family of G protein coupled receptors comprising over 250 olfactory G protein-coupled receptors (OR) active in olfactory perception (page 4). The specification indicates general means of detection for nucleic acids and proteins. The specification states that the invention preferably provides methods for representing the perception of odor (or taste) and/or for predicting the perception of odor (or taste) in a mammal, including human. The specification does not appear to provide any particular analysis for SEQ ID NO: 55 or 56.

The response filed July 2, 2003 advises "that bioinformatics, genetic and sensory analysis indicate that" the elected AOLFR029 sequence (SEQ ID NO: 55 and 56) "encodes a receptor involved in the smell of androstenone, a component of sweat. Genetic analysis indicate that alleles of this gene correlates to the inability to smell androstenone." These statements provided in the response do not appear to be part of the originally filed specification. The specification does not disclose or even suggest that SEQ ID NO: 56 or a nucleic acid encoding SEQ ID NO: 55 is involved in the smell of androstenone, a component of sweat. While a specification need not disclose what is well known in the art, that rule does not excuse an applicant from providing a complete disclosure. See Genentech Inc. v. Novo Nordisk A/S, 108 F.3d 1361, 1366, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997): "It is the specification, not the knowledge of one skilled in

the art, that must supply the novel aspects of an invention in order to constitute adequate enablement." The same is true of utility.

The claimed polynucleotides are not supported by a specific asserted utility because the disclosed uses of the polynucleotides are non specific uses that are applicable to polynucleotides in general and not particular or specific to the polynucleotide being claimed. It is noted that the specification asserts that SEQ ID NO 56 may function as an olfactory receptor, however the specification has not demonstrated such nor is this use specific for SEQ ID NO 56 as a number of other receptors have such a function. The fact that a receptor may be an olfactory receptor does not make clear or apparent the function or specificity of the receptor, nor does it identify the ligand for the receptor. Reed teaches that odorant receptors belong to a multigene family with at least 500-1000 members (col. 1, lines 30-35). As specifically provided by Reed (US Pat. 6,492,143, December 10, 2002), "to analyze odorant/ligand-receptor interactions and their effects on cell physiology, it is first necessary to identify specific odorant/ligand(s) and the olfactory receptors to which they specifically bind. Such analysis requires isolation and expression of olfactory receptor polypeptides. However, despite the fact that many putative olfactory receptors have been cloned, only limited progress has been made in the functional expression of these receptors because present systems fail to efficiently translocate these 7-transmembrane proteins to the plasma membrane. This may be because olfactory receptors are a subclass of 7-transmembrane-domain receptors. For example, expression of one rat olfactory receptor in insect cells resulted in only a modest elevation in second messengers when

exposed to a mixture of odorants; responses to single compounds were not seen (Raming (1993) Nature 361:353-356)(col. 1, lines 45-55).

Further, the claimed polynucleotides are not supported by a substantial utility because no substantial utility has been established for the claimed subject matter. For example, a polynucleotide can be used to produce a polypeptide which can be used to obtain an antibody. The protein may be used to study the expression. The antibody could then be used in conducting research to functionally isolate the protein. The need for such research clearly indicates that the protein and/or its function is not disclosed as to a currently available or substantial utility. A starting material that can only be used to produce a final product does not have substantial asserted utility in those instances where the final product is not supported by a specific and substantial utility. In this case, none of the proteins or antibodies that are to be produced as final products resulting from processes involving claimed polynucleotides have specific and substantial utilities. The research contemplated by applicant(s) to characterize potential protein products, especially their biological activities, does not constitute a specific and substantial utility. Identifying and studying the properties of a protein itself or the mechanisms in which the protein is involved does not define a "real world" context of use. Similarly, the other listed and asserted utilities as summarized above or in the instant specification are neither substantial nor specific due to being generic in nature and applicable to a myriad of such compounds. Note, because the claimed invention is not supported by a specific and substantial asserted utility for the reasons set forth above, credibility of the utility has not been assessed.

As noted by Brenner v. Manson, 383 US 519, 535-536 (1996), "Congress intended that no patents be granted on a chemical compound whose sole "utility" consists of its potential role as an object of use - testing... a patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion."

Claim Rejections - 35 USC § 112- Enablement

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-59, 77-80, 82-84 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific or substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 112-Description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-45, 47-59, 77-80, 82-84 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the

inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to nucleic acids, vectors and host cells which comprise fragments of at least 75 nucleotides or various percentages as low as 30% similarity with SEQ ID NO: 55 or 56.

The art teaches a mouse olfactory receptor MOR158-1 gene cDNA (Genbank Accession Number AY073037, April 2002, see alignment) which is 75.1% identical to SEQ ID NO: 55. The cDNA contains 807 matches and 147 mismatches.

Moreover, the art teaches a rat clone (Genbank Accession Number Ac108977, October 2002, see alignment) which is 72.9% identical to SEQ ID NO: 55. Each of these sequences are encompassed by the instant claims.

Vas-Cath Inc. V. Mahurkar, 19 USPQ2b 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, whatever is now claimed". Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. In *The Regents of the University of California v. Eli Lilly* (43 USPQ2b 1398-1412), the court held that a generic statement which defines a genus of nucleic acids by only their functional activity does not provide an adequate written description of the genus. The court indicated that while Applicants are not required to disclose every species encompassed by a genus, the description of a genus is achieved by the recitation of a representative number of DNA molecules, usually defined by a

nucleotide sequence, falling within the scope of the claimed genus. At section B(1), the court states that "An adequate written description of a DNA...' required a precise definition, such as by structure, formula, chemical name, or physical properties', not a mere wish or plan for obtaining the claimed chemical invention". In analyzing whether the written description requirement is met for a genus claim, it is first determined whether a representative number of species have been described by their complete structure. In the instant case, the specification appears to provide a full length cDNA sequence. The claims are broadly drawn to fragments of at least 75 nucleotides and percent identities.

Applicant has not disclosed any genomic DNA sequences and particularly has not disclosed any intron sequences or regulatory sequences. A review of the specification indicates that elements which are not particularly described, including regulatory elements and intronic regions which are essential to the function of the claimed invention because the claims are broad enough to encompass each of these elements. There is no actual reduction to practice of the claimed invention, clear depiction of the claimed invention in the drawings or complete detailed description of the structure. Considering all disclosed distinguishing identifying characteristics, there is a disclosure of a cDNA structure as well as the asserted function as a olfactory receptor. However, there is no known or disclosed correlation between this function and the structure of the non-described intronic elements and regulatory elements of the genomic sequence. Furthermore, there is no additional disclosure of physical and/or chemical properties. Weighing all factors in view of the level of knowledge and skill in the art, one

skilled in the art would not recognize from the disclosure that the application was in possession of the genus of nucleic acids comprising a minimal 75 nucleotides or a minimal 30% identity with SEQ ID NO: 56 or encoding SEQ ID NO: 56.

The claims also encompass allelic variants, SNPs, mutations, deletions, splice variants, homologues, etc. Claim 1, part vii, specifically claims a naturally occurring allelic or synthetic variant of a nucleic acid sequence containing at least one substitution, deletion or addition mutation in the coding region. The specification discloses a single cDNA sequence, however, fails to describe any variants. There is no description of mutational sites that exist in nature and there is no description of how the structure of SEQ ID NO: 56 or encoding SEQ ID NO: 56 relates to the structure of any strictly neutral alleles. The general knowledge in the art concerning alleles does not provide any indication of how the structure of one allele is representative of unknown alleles. The nature of alleles is that they are variant structures, and in the present state of the art the structure of one does not provide guidance to the structure of others. The common attributes of the genus is not described. One of skill in the art would conclude that applicant was not in possession of the claimed genus because a description of only one member of this genus is not representative of the variants of the genus and is insufficient to support the claim.

With respect to hybridization conditions, Example 9 of the Written Description Guidelines provides an example of a nucleic acid which hybridizes under highly stringent conditions and binds to a dopamine receptor and stimulates adenylate cyclase activity. There is a single species disclosed (a molecule consisting of SEQ ID NO: 56 or

encoding SEQ ID NO: 55) that is within the scope of the claimed genus. A person of skill in the art would expect substantial variation among species encompassed within the scope of the claims because the "specifically hybridizes" under "stringent conditions" would not yield structurally similar DNAs. A representative number of species has not been disclosed, since there is no function or specific structure for the "fragments which specifically hybridizes and exhibits at least 30% identity under stringent conditions."

With respect to percent identity, Example 14 of the Written Description Guidelines provides an example of a biological material with at least 95% identity and functional language. The claims directed to percent identity encompasses variant sequences which have not described, as discussed above. The instant specification fails to provide a specific assay for SEQ ID NO: 56 or encoding SEQ ID NO: 55 to assess the function of the nucleic acids. One of skill in the art would conclude that applicant was not in possession of the necessary common attributes possessed by the members of the genus.

Accordingly, Applicants have not adequately disclosed the relevant identifying characteristics of a representative number of species within the claimed genus.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-22, 28-35, 39-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Birren et al. (Genbank Accession Number AC006313, January 26, 1999).

Birren et al. (herein referred to as Birren) teaches a nucleic acid homo sapiens chromosome 9 clone. The nucleic acid clone contains all 957 nucleotides of SEQ ID NO: 56. SEQ ID NO: 56 is 100% identical to positions 16978-16022 of the clone taught by Birren (see attached alignment). Thus, the nucleic acid is at least 30%, 40%. etc identical. Moreover, the nucleic acid specifically hybridizes with SEQ ID NO: 55. The clone would encode an amino acid sequence comprising SEQ ID NO: 55. The nucleic acid comprises 957 nucleotides of SEQ ID NO: 56, thus, the nucleic acid of Birren is a fragment which comprises at least 75 nucleotides of SEQ ID NO: 56. Thus, since Birren teaches every limitation of the claimed invention, Birren anticipates the claimed invention.

9. Claims 1-22, 26-37, 39-45, 47-54, 77-80, 82-84 are rejected under 35 U.S.C. 102(e) as being anticipated by Burford et al. (WO 2001/42288, Published June 14, 2001, provisional date January 21, 2000).

Burford teaches a human G-protein coupled receptor-27 (GCREC-27)(SEQ ID NO: 66) cDNA which is 100% identical with 954 nucleotides of SEQ ID NO: 56 (see attached alignment). The nucleic acids are identical except the first ATG of the instant

SEQ ID NO: 56 which is missing from the instant cDNA which begins with an ATG. The nucleic acid of Burford comprises at least 75 nucleotides from SEQ ID NO: 56, namely positions 4-957 (limitations of Claim 1, 2, 4-8, 14-22). The polypeptides of SEQ ID NO: 55 and the polypeptide encoding the nucleic acid of Burford are identical except for one less Met at the beginning of the amino acid sequence, thus, the fragment encodes at least 25 contiguous amino acid residues, namely 317 contiguous amino acids (limitations of Claim 3, 9-13, 28-35, 39-45)(see alignment provided). Burford teaches that the polynucleotide sequences may be cloned in recombinant DNA molecules in appropriate host cells (page 30). Moreover, Burford teaches "in order to express a biologically active GCREC, the nucleotide sequence may be inserted into an appropriate expression vector which contains the necessary element for transcriptional and translational control (limitations of Claim 36-37, 47, 78-79, 83). The expression vector/host systems may include microorganism, yeast transformed, insect cell systems, animal cell systems (page 32)(limitations of Claim 48). Burford teaches transformed cells including mammalian, human, CHO, HeLa, MDCK, yeast and insect (page 32-35)(limitations of Claim 49-53, 80). Burford teaches placing the nucleic acids on microarrays (page 70)(limitations of Claims 54). Burford teaches making stable expression of GCREC in cell lines which may be stably transformed cells used to propagate (page 33)(Claims 82, 84). Burford also teaches that selectable genes may be used to detect and identify transformants such as luciferase, antibiotic or herbicide resistance, or green fluorescent proteins (page 34)(limitations of Claim 26-27). Thus,

since Burford teaches every limitation of the claimed invention, Burford anticipates the claimed invention.

Conclusion

10. No claims allowable over the art.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) SEQ ID NO: 56 of the instant application is identical to SEQ ID NO: 56 of 09/886,055. There is at least one inventor in common with the instant application. The inventive entities are different. The claims of '055 are drawn to methods which are patentable distinct from the instant claimed nucleic acids.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Jeanine Goldberg whose telephone number is (703) 306-5817. The examiner can normally be reached Monday-Friday from 8:00 a.m. to 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones, can be reached on (703) 308-1152. The fax number for this Group is (703) 305- 3014.

Any inquiry of a general nature should be directed to the Group receptionist whose telephone number is (703) 308-0196.

J. Goldberg

Jeanine Goldberg
Patent Examiner
October 2, 2003